

# **TA to Connectivity in the Western Balkans**

**EuropeAid/137850/IH/SER/MULTI**

## **Sub-Project**

*Code: CONNECTA-TRA-CRM-REG-01*

*Area: Connectivity Transport Reform Measures*

**Preparation of Road Safety Inspection and Audit Plans for  
core/comprehensive road network in Western Balkans (WB6) and  
Pilots**

**Component 2 Road Safety Audit – Final Report**

**31 May 2018**



**This project is funded by  
The European Union**



# Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
1.0	15/04/18	MC	JM	KG	RSA Draft Report
2.0	31/05/18	MC	JM	KG	RSA Final Report

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## Information class: EU Standard

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## List of Abbreviations

ALB/AL	Albania
AO	Administrative Order
ARA	Albanian Roads Authority
BiH	Bosnia and Herzegovina
CA	Contracting Authority
CNC	Core Network Corridor
Connecta	Technical Assistance to Connectivity in the Western Balkans
Connecta	The MMD led Consortium implementing Connecta
CRM	Connectivity Reform Measures
CRMMP	Connectivity Reform Measures Management Plan
DG MOVE	Directorate-General for Mobility and Transport
DG NEAR	Directorate-General for Neighbourhood and Enlargement Negotiations
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EU	European Union
EUR	Euro (currency)
EuroRAP	The European Road Assessment Programme
FBiH	Federation of BiH (entity)
FR	Final Report
ICJ	International Court of Justice
IFI	International Financing Institution
IFICO	International Financing Institution Coordination Office
IPA	Instrument for Pre-accession Assistance
IPF	Infrastructure Project Facility
ITS	Intelligent Transport Systems
IR	Inception Report
iRAP	The International Road Assessment Programme
KE	Key Expert
KfW	Kreditanstalt für Wiederaufbau (Bank)
KoM	Kick-off-Meeting
KOS	Kosovo* (hereinafter referred to as Kosovo)
MAP	Multi Annual Plan
MED	Mediterranean (corridor)
MKD	the former Yugoslav Republic of Macedonia
MMD	Mott MacDonald
MNE/MON	Montenegro
MoTC/MoI/MoCTI	Ministry related to Transport and Infrastructure
MoT	Ministry of Transport

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\* This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

MTI	Ministry of Transport and Infrastructure
PD	Preliminary Design
PDF	Project Description Form
PE	Public Enterprise
PERS/PE RoS	Public Enterprise Roads of Serbia
PESR	Public Enterprise for State Roads (Macedonia)
PM	Project Manager
REG	Regional
RFA	Request for Approval
RS	Republic of Srpska (entity of BiH)
RS	Road Safety
RSA	Road Safety Audit
RSI	Road Safety Inspection
RSWG	Road Safety Working Group
SEETIS	South East Europe Transport Information System
SEETO	South East Europe Transport Observatory
SRB/SER	Serbia
TA	Technical Assistance
TL	Team Leader
ToR	Terms of Reference
TRA	Transport
WB	Western Balkan
WB6	Western Balkans 6 countries
WB (G)	World Bank (Group)

## 1 SYNOPSIS

Project (sub-project) Title:	<b>Preparation of Road Safety Inspection (RSI) and Audit (RSA) Plans for core/comprehensive network in Western Balkans (WB6) and Pilots Final report - Road Safety Audit (RSA)</b>
Project Code:	CONNECTA-TRA-CRM-REG-01
Area:	Connectivity Transport Reform Measures in WB6
Contracting Authority:	European Commission - DG NEAR
Main Beneficiary/Monitoring:	SEETO
End Beneficiaries:	Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Kosovo, Montenegro and Serbia
Context:	Regional
Consultant:	Mott MacDonald Ltd. (UK) in Consortium with COWI A/S, WYG, CeS COWI, TRENECON, SYSTEMA
Administrative Order:	31 May 2017 (supplementary on 26 June 2017)
Mobilisation of NKEs:	05 June 2017 (Kick-off Meeting with SEETO at 13 June 2017)
Sub-Project Duration:	12 months
Anticipated completion:	04 June 2018
Responsible Transport KE:	Kostas Georgiou

## 1.1 Purpose and Objectives

### 1.1.1 Background

The South East Europe Region has a high road crash rate compared to EU countries with the 6 SEETO Regional Participants having almost 84 road deaths per million population in 2016 compared to the EU28 at just over 50 road deaths per million of population. In 2016, more than 1,500 were killed and almost 55,000 were injured in the SEETO Regional Participants according to MAP2018<sup>1</sup>. The road safety reform progress around the WB6 varies but is generally low. The EU Directive 2008/96/EC is not (or only partly) transposed in national legislations.

The Preparation of Road Safety Inspection (RSI) and Audit (RSA) Plans for core/comprehensive network in Western Balkans (WB6) and Pilots Project commenced with a Kick-off Meeting on the 13 June 2017 with an expected project duration of 12 months.

### 1.1.2 Project Purpose

The purpose of this TA is to prepare short-term plans (2018-2020) for road safety inspection and audit for the whole Core and Comprehensive Road Network in the Western Balkans. This consultancy will - as RSI/RSA pilots - also deliver a part (10% and 6 projects, respectively) of these overall plans in 2018.

The objective is to provide direct support to the Western Balkans' ministries responsible for transport and infrastructure and to road authorities for programming infrastructure maintenance and to assist the SEETO Secretariat in monitoring the implementation of relevant transport measures in the framework of Connectivity Agenda.

### 1.1.3 Objectives of TA

The specific objectives of this TA are to support the implementation of the 2nd, 3rd and 4th road safety measures under the CRMMP for 2016/2017:

- Prepare three-year RSI plan for the core and comprehensive network and pilot RSIs on high accident sections
- Help to ensure that road safety audits are carried out according to the Directive 2008/96/EC on all projects on the core and comprehensive network and undertake sample audits
- Support RPs in establishment of a national system for continuous road crash data collection (by 2018).

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<sup>1</sup> SEETO Multi-Annual Development Plan, Multi-Annual Plan 2018, Common problems – Shared solutions



#### 1.1.4 Activities of component 2

The three activities contained within this component are:

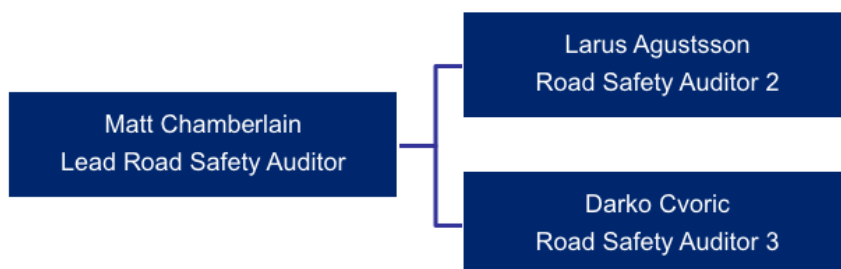
**Activity 1** Compile a list of all expected rehabilitation and new construction road projects on the core and comprehensive road network that are currently under the concept or preliminary design stage in the six Western Balkans Regional Participants.

**Activity 2** Prepare a plan to undertake road safety audits, at various stages as per the Directive 2008/96/EC and SEETO's Road Safety Audit Guidelines for the list of projects prepared under Activity 1. Such plan should include the Audit stages that are required, as well as the required Auditors inputs and indicative costs.

**Activity 3** Undertake Road Safety Audits for a sample of six projects, one in every SEETO Regional Participant.

### 1.2 The RSA Team of Non-Key Experts

The RSA Team is also supported by four local traffic engineers to provide in country support for missions and information gathering.



## 2 List of Rehabilitation and Construction Projects

Activity One, involves compiling a list of all rehabilitation and new construction road projects on the core and comprehensive road network that are currently under preparation. The list should include the following details for every project:

- Engineering scope and estimated cost
- Current preparation stage of every project (e.g. concept, preliminary design, detailed design or bidding stage)
- Planned implementation schedule
- Financing sources.

Initial requests were sent by SEETO in June 2017 at project commencement to all SEETO Regional Participants for a list of all expected rehabilitation and new construction road projects on the core and comprehensive road network that are currently under the concept, preliminary or main design stage. Information was received from Serbia, Montenegro and BiH at this stage.

This information has been used to feed into Activity Two and according to the Work Plan the deadline for information was Sept 2017. However, due to slow responses from SEETO participants this information remains incomplete.

In September and October, the RSA Project Team requested information from those remaining countries from which nothing had previously been received. The RSA Project Team also anticipate filling any information gaps during missions for Activity 3 Pilot RSA's. During beginning of 2018 SEETO sent a reminder to the Regional Participants on outstanding data supplemented with a priority on data needed and data nice to have.

This information has been provided in the following sections and any current information gaps highlighted. The tables below represent the information in the raw format as received by the SEETO Participants. The legend below explains the information contained in each column:

**Type of Road:** Whether main or motorway

**Design Stage:** Concept, Preliminary, Detailed, Bidding

**Works Type:** Rehabilitation, upgrade or new construction

**Start/End:** Construction timeline

**Total Cost:** Total Construction Costs

**Budget:** Cost of works met by state

**WB:** Cost met by the World Bank or other IFIs

**Funding Source:** Funded by state or IFIs

## 2.1 Albania - List of Rehabilitation and Construction Projects identified

Route	Section Start	Section End	Length (km)	SEETO Network	Type of Road	DESIGN STAGE	WORKS TYPE:	START:	END:	Total cost (M€)	Budget (M€)	WB (M€)	funding source
SH2 Corridor VIII	Tirana	Vore	16	Core	Main road	Detailed	Resurfacing	2017	2021	0,945	0,472.5	0,472.5	WB
SH2 Corridor VIII	Vore	Durres	22	Core	Main Road	Detailed	Resurfacing	2017	2021	3,257	1,628	1,628	WB
SH4-N Corridor VIII	Durres	Rrogozhine	37	Core	Main road		Resurfacing New construction	2017	2021	3,982	1,991	1,991	WB
SH4-N Corridor VIII	Rrogozhine	Lushnje	20	Core	Main Road	Detailed	Resurfacing	2017	2021	0,07	0,035	0,035	WB
SH4-N Corridor VIII	Lushnje	Fier	22	Core	Main road		Resurfacing New construction	2017	2021	9,552	4,776	4,776	WB
SH8 Corridor VIII	Fier	Vlore	39	Comprehensive Core	Main Road	Detailed	Resurfacing New construction	2017	2021	1,155	0,577	0,577	WB
SH7 Corridor VIII	Elbasan	Librazhd	25	Core	Main road	Detailed	Resurfacing	2017	2021	1,455	0,727	0,727	WB
SH7 Corridor VIII	Librazhd	Perrenjas	34	Core	Main Road	Detailed	Resurfacing	2017	2021	0,846	0,423	0,423	WB
A3 Corridor VIII	Tirana	Elbasan	32	Core	Main road	Detailed	Resurfacing New construction	2017	2021	1,055	0,527	0,527	WB
SH1-N Route 1	Shkoder	Lezhe	42	Comprehensive Core	Main Road	Detailed	Resurfacing	2017	2021	1,420	0,710	0,710	WB
SH1-N Route 1	Lezhe	Milot	13	Core	Main road	Detailed	Resurfacing	2017	2021	1,615	0,807	0,807	WB
SH1-N Route 1	Mamurras	Fushe Kruje	14	Core	Main road	Detailed	Resurfacing	2017	2021	1,222	0,611	0,611	WB
SH1-N Route 1	Fushe Kruje	Vore	13	Core	Main Road	Detailed	Resurfacing	2017	2021	2,494	1,247	1,247	WB
SH1-N Route 2b	Hani i Hotit	Shkoder	35	Comprehensive	Main road	Conceptual	Resurfacing New construction	2017	2021	0,859	0,4295	0,4295	WB
SH4-N Route 2c	Fier	Tepelene	71	Core	Main road	Detailed	Resurfacing	2017	2021	4,438	2,219	2,219	WB
SH4-O Route 2c	Tepelene	Gjirokaster	23	Core	Main Road	Detailed	Resurfacing	2017	2021	0,786	0,393	0,393	WB
SH4-O Route 2c	Gjirokaster	Kakavija	31	Core	Main road	Detailed	Resurfacing	2017	2021	4,438	2,219	2,219	WB
SH1-N Route 7	Milot	Mamurras	14	Core	Main Road		Resurfacing	2017	2021	0,752	0,376	0,376	WB
A1 Route 7	Milot	Rreshen	25.9	Core	Main Road	Detailed	Resurfacing	2017	2021	Concess 64.0			

Route	Section Start	Section End	Length (km)	SEETO Network	Type of Road	DESIGN STAGE	WORKS TYPE:	START:	END:	Total cost (M€)	Budget (M€)	WB (M€)	funding source
A1 Route 7	Rreshen	Kalimash	60.2	Core	Main road		Resurfacing	2017	2021	Concess			
A1 Route 7	Kalimash	Morine	28.3	Core	Main Road		Resurfacing	2017	2021	Concess			
SH3	Perrenjas	Pogradec	27	Core	Main Road	Detailed	Resurfacing	2017	2021	2,696	1,348	1,348	WB
SH3	Pogradec	Korce	40	Comprehensive	Main road		Resurfacing Partially new construction	2017	2021	1,400	0,700	0,700	WB
SH3	Korce	Kapeshtice	32	Comprehensive	Main Road	Detailed	Resurfacing	2017	2021	1,058	0,529	0,529	WB
SH3	Perrenjas	Qafe Thane	13	Core	Main road	Detailed	Resurfacing	2017	2021	0,295	0,147.5	0,147.5	WB

Missing information on Design Stage for 7 projects is needed.

Sources in the table:

Black letters and numbers – RP

Blue letters and numbers – Consultant's informations

Red letters and numbers – SEETO or SEETO MAP 2018 Final

## 2.2 Bosnia and Herzegovina (Federation of BiH and Republic of Srpska) - List of Rehabilitation and Construction Projects identified

Route	Name	Start	End	Length (km)	Type	SEETO Network	DESIGN STAGE	WORKS:	START:	END:	Total cost (M€)	Funding source
Route 2a	M-16 (Klašnice 2-Šargovac)	33+010,00	42+463,00	9.453	Main	Core		Rehabilitation	2017			
Route 2a	M-16 (Šargovac - Banja Luka 1)	42+463,00	46+374,00	3.911	Main	Core		Rehabilitation	2017			
Route 2a	M-16 (Banja Luka 1 - Banja Luka (Čajavec))	46+374,00	47+430,00	1.056	Main	Core		Rehabilitation	2017			
Route 2a	M-16 (Banja Luka (Čajavec)-Banja Luka (Rudarska))	47+430,00	48+386,00	0.956	Main	Core		Rehabilitation	2017			
Route 2a	M-16 (Banja Luka (Rudarska)-Srpske Toplice)	48+386,00	52+704,00	4.318	Main	Core		Rehabilitation	2017		-	
Route 2a	M-16 (Srpske Toplice-Karanovac)	52+704,00	59+396,00	6.692	Main	Core		Rehabilitation	2017		-	
Route 2a	M-16 (Karanovac-Crna Rijeka)	59+396,00	92+182,00	32.786	Main	Core	Main design	Rehabilitation	2017 2018	- 2018	- 3	National budget
Route 2a	M-16 (Crna Rijeka-granica RS (Ugar))	92+182,00	98,717,00	6.535	Main	Core		Rehabilitation	2017	-	-	
Route 2b	Brod na Drini - Hum	Brod na Drini	Hum		Main	Comprehensive	Main design	Partially reconstruction and partially new	June, 2016	Aug, 2018	3.5	EBRD
Route 9a	"9. Januar" Laktaši - Prnjavor	0+000,00	35+912,51	35.913	Motorway	Comprehensive	Main design	New	2017 2015	2018	47+	EBRD (?) and EIB (47)

Missing Design Stage and End date that is needed. Nice to have: Total cost (M€), Budget cost (state) (M€), IFI cost (M€) and Funding source.

Sources in the table:

Black letters and numbers – RP

Blue letters and numbers – Consultant's informations

Green letters and numbers – EBRD and EIB informations

Brown letters and numbers (road section added by the Consultant) – WBIF IPF Bimonthly Report 1801-1802

Orange letters and numbers – PE "Republic of Srpska Roads" Procurement plan for 2018

([http://www.putevirs.com/korisnik/dokumenti/Plan\\_javnih\\_nabavki\\_za\\_objavu\\_2018.pdf](http://www.putevirs.com/korisnik/dokumenti/Plan_javnih_nabavki_za_objavu_2018.pdf))

## 2.3 Macedonia - List of Rehabilitation and Construction Projects identified

Route	Name	Start	End	Length (km)	Type	SEETO Network	DESIGN STAGE	WORKS:	START:	END:	Total cost (M€)	Funding source
Corridor VIII (Kicevo – Podmolje) and Route 8 (Podmolje – Ohrid)	Kicevo – Ohrid				motorway			New				
Corridor VIII	Rankovce – Kriva Palanka				express			New				
Corridor X	Demir Kapija – Smokvica	Demir Kapija	Smokvica	28,2	motorway		Detailed	New	2015	2018	286	EIB(100),EBRD (107) and EC(grant 45)
Corridor X	Gradsko – Veles				motorway			Rehabilitation				
Corridor X	Miladinovci – Petrovec				motorway			Rehabilitation				
Corridor X	Negotino - Demir Kapija				motorway			Rehabilitation				
Corridor X	Kumanovo- Miladinovci				motorway			Rehabilitation				
Corridor X	Smokvica – Gevgelija				motorway			Rehabilitation				
Corridor Xd	Gradsko – Prilep				express			New				
Corridor Xd	Prilep – Raec	Prilep	Raec	8.8		Core		Construction and reconstruction			5.0	
Route 6a	Skopje - Blace	Skopje	Blace		motorway	Core	Preliminary	New	Apr, 2015	Mar 2018	1.0	EBRD
Route 10	Stip – Radovis	Interchange Tri Cesmi	Bucim	37	express			New	2015		78.4	EBRD (64)
Route 10	Miladinovci – Stip				motorway			New				
	Stip – Kocani				express	It is not part of SEETO road network		New				

Brief project list provided in June 2017 and further information was requested in Oct 2017 and March 2018. Nothing further received to date. Most data is missing including the essential ones such as Route, Start and end year, and design stage.

Sources in the table:

Black letters and numbers – RP

Green letters and numbers – EBRD, EIB or CFCD (Central Financing and Contracting Department- <http://cfcd.finance.gov.mk/>) informations

Red letters and numbers – SEETO or SEETO MAP 2018 Final

Brown letters and numbers (road section added by the Consultant) – WBIF IPF Bimonthly Report 1801-1802 (Skopje – Blace) and SEETO MAP 2018 Final (Prilep – Raec)

## 2.4 Kosovo - List of Rehabilitation and Construction Projects identified

Route	Name	Start	End	Length (km)	Type	SEETO Network	DESIGN STAGE	WORKS:	START:	END:	Total cost (M€)	Funding source
Route 6a	Smrekonicë Mitrovivë			5	Main	Comprehensive	Preliminary	Rehabilitation	2018	2020		
Route 6b	Kijevë Zahaq	Kijevë	Zahaq	30	Main	Comprehensive	Detailed Preliminary	New construction	2018	2021	143.2	WBIF, Kosovo budget, EBRD, EIB
Route 6b	Pristina-Peje	Pristina	Peje	40	Main	comprehensive	Detailed	New	2015		83.0	
R6 Route 7	Besi Merdare/Serbia Border	Besi	Merdare/ Serbia border	26.5	Main	Core	Concept Preliminary	New construction	Sep, 2017	Oct, 2018	150	EBRD

Start and end date missing for one projects which is needed. Nice to have would be start/end chainages, costs and financing sources that have not been provided at the time of writing.

Sources in the table:

Black letters and numbers – RP

Green letters and numbers – EBRD informations

Red letters and numbers – SEETO or SEETO MAP 2018 Final

Brown letters and numbers (road section added by the Consultant) – WBIF IPF Bimonthly Report 1801-1802 and SEETO MAP 2018 Final

## 2.5 Montenegro - List of Rehabilitation and Construction Projects identified

Route	Name of the Project (sections)	Start	End	Length (km)	Type of road	SEETO Network	Technical description	DESIGN STAGE:	WORKS:	START:	END:	Total cost (M€)	EBRD (M€)	EIB (M€)
Route 1	Debeli brijeg - H novi	854+500	859+500	5	National	Core	Rehabilitation		Rehabilitation	2018	2018			
Route 1	Debeli brijeg - H novi	859+500	861+900	2.4	National	Core	Rehabilitation		Rehabilitation	2018	2018			
Route 1	Petrovac - Bar	1+200	18+000	16.8	National	Core	Rehabilitation		Rehabilitation	2017	2018			EIB
Route 2b	Šćepan polje – Plužine	0+000	25+000	25	National	Core	Reconstruction		New			74,2 (WBIF grant 4,2)	70	0
Route 2b	Zaborje - Jasenovo polje	46+000	65+000	19	National	Core	Rehabilitation		Rehabilitation	2019	2020			
Route 2b	Jasenovo polje - Vidrovan	65+000	70+500	5.5	National	Core	Rehabilitation		Rehabilitation	2018	2018			
Route 2b	Danilovgrad - Podgorica	114+500	129+500	15	National	Core	Reconstruction		New	2017	2018		EBRD	
Route 3	Lipci - Ljuta			15	National	Core	Rehabilitation		Rehabilitation	2018	2018			
Route 4	Tivat -Budva	885+500	901+500	16	National	Core	Reconstruction		New	2017	2019		EBRD	
Route 4	Barski most - Dobrakovo	131+200	135+300	4.1	National	Core	Rehabilitation		Rehabilitation	2017	2018			EIB
Route 5	Kamenovo - Petrovac	911+700	923+000	10.3	National	Core	Rehabilitation		Rehabilitation	2017	2018			EIB
Route 5	Dobrakovo - Bijelo polje	135+300	145+600	10.3	National	Core	Rehabilitation		Rehabilitation	2017	2018			EIB
Route 6a	Obilaznica Bijelo polje - Ribarevine	150+000	153+300	3.3	National	Core	Rehabilitation		Rehabilitation	2017	2018			
Route 6a	Ribarevine - Poda	1089+872	1104+300	14.5	National	Core	Rehabilitation		Rehabilitation	2017	2018			EIB
Route 6a	Poda -Berane	1104+559	1117+300	12.8	National	Core	Rehabilitation		Rehabilitation	2017	2018			EIB
Route 6a	Berane - Tunel Lokve	1117+300	1132+507	15.2	National	Core	Rehabilitation		Rehabilitation	2017	2018			EIB
Route 6a	Tunel Lokve - Rožaje	1133+507	1148+200	14.7	National	Core	Rehabilitation		Rehabilitation	2017	2018			EIB
Route 6a	Obilaznica Rožaje II Phase	0	5+000	5	National	Core	New		New	2017	2019			EIB
Route 6a	Rožaje - Špiljani	1148+200	1168+200	20	National	Core	Rehabilitation		Rehabilitation	2017	2019		EBRD	
Route 6b	Andrijevisa - Berane	0	16+000	16	National	Core	Rehabilitation		Rehabilitation	2018	2019			
Route 7	Bar - Ulcinj	23+900	45+300	21.4	National	Core	Rehabilitation		Rehabilitation	2018	2019			
Route 7	Ribarevine - Lepenac	1075+200	1089+850	14.6	National	Core	Rehabilitation	Detailed	Rehabilitation	2017	2018			EIB
Route 8	Ulcinj - Krute	45+300	60+000	14.7	National	Core	Rehabilitation		Rehabilitation	2017	2018			EIB
Route 8	Mojkovac - Kolašin	1067+500	1046+150	21.35	National	Core	Rehabilitation	Preliminary	Rehabilitation	2018	2019			
Route 9a	Kolašin - Crkvine	1037+200	1046+150	8.95	National	Core	Rehabilitation	Preliminary	Rehabilitation	2018	2019			
Route 10	Tuneli 7,8,9	1010+530	1011+200	0.67	National	Core	Reconstruction		New	2018	2019			
Route 11	Obilaznica golubovci - Virpazar	946+300	962+800	16.5	National	Core	Rehabilitation		Rehabilitation	2018	2019			
Route 12	Virpazar - Paštrovačka gora	946+300	931+500	14.8	National	Core	Rehabilitation		Rehabilitation	2018	2020			



Route	Name of the Project (sections)	Start	End	Length (km)	Type of road	SEETO Network	Technical description	DESIGN STAGE:	WORKS:	START:	END:	Total cost (M€)	EBRD (M€)	EIB (M€)
Route 13	Paštrovačka gora - Petrovac	931+500	924+000	7.5	National	Core	Rehabilitation		Rehabilitation	2018	2020			

Design Stage (Preliminary, Conceptual, Detailed, etc.) and partly Start and End dates that is needed was not provided at time of writing. Would be nice to have: Total cost (M€), Budget cost (state) (M€), IFI cost (M€) and Funding source has been provided at time of writing.

Sources in the table:

Black letters and numbers – RP

Green letters and numbers – EBRD informations

## 2.6 Serbia - List of Rehabilitation and Construction Projects identified

Route	Start	End	Length (km)	Type of road	SEETO Network	DESIGN STAGE	WORKS:	PROJECT START:	PROJECT END:	Total cost (M€)	Budget (M€)	WB (M€)	Funding source
Corridor X	Ražanj 1	Paraćin 1	24.781	Highway	Core	Detailed	Rehabilitation	2018	Jan-19		0.597		EBRD
Corridor X	Aleksinac	Ražanj 1	23.645	Highway	Core	Detailed	Rehabilitation	2018	Jan-19				
Corridor X	Ruma 1	Pećinci 1	12.99	Highway	Core	Detailed	Rehabilitation	2018	Dec-18				
Corridor X	Sremska Mitrovica	Ruma 1	13.75	Highway	Core	Detailed	Rehabilitation	2018	Jan-19				
Corridor X	Niš 1 (Trupale)	Niš 3 (Batušinac)	9	Highway	Core	Detailed	Rehabilitation	2018	Jan-19		0.735		EBRD
Corridor X	Niš 3 (Batušinac)	Niš 1 (Trupale)	8.998	Highway	Core	Detailed	Rehabilitation	2018	Jan-19				
Corridor X	Ražanj 1	Aleksinac	23.655	Highway	Core	Detailed	Rehabilitation	2018	Jun-19		0.198		EBRD
Corridor X	Brestovac 1	Doljevac 1	6.155	Highway	Core	Detailed	Rehabilitation	2018	Apr-19		0.051		EBRD
Corridor X	Border CRO/SER (Batrovci)	Kuzmin	21.805	Highway	Core	Detailed	Rehabilitation	2017	Feb-18	0.0055	0.191	0.005462126	EBRD
Route 3	Požega	Kotroman	60	Highway	Comprehensive	Prelim	construction	2006		830			
Route 4	Border of APV (Pančevo)	Pančevo (Kovin)	2.766	Motorway	Core	Detailed	Rehabilitation	2017	Jul-18		0.261		WB/EIB/PERS
Route 4	Pančevo (Kovin)	Border of APV (Pančevo)	2.754	Motorway	Core	Detailed	Rehabilitation	2017	Jul-18				
Route 4	Kneževiči	Užice 3	15.234	Motorway	Core	Detailed	Rehabilitation	2017	Jun-18	0.00381	0.153	0.003816098	WB/EIB/PERS
Route 4	Požega	Boljare	107	Highway	Core	Prelim	construction	2006		1830.9			
Route 5	Pojate	Preljina	110	Highway	Comprehensive	Prelim	construction	2015		640			
Route 7	Merošina	Prokuplje (Orljane)	11.503	Motorway	Core	Detailed	Rehabilitation	2017	Nov-18		0.243		WB/EIB/PERS
Route 7	Beloljin	Rudare	24.171	Motorway	Core	Detailed	Rehabilitation	2017	Nov-18				
Route 7	Niš	Pločnik	40	Highway	Core	Feasibility Prelim	construction	2014 Feb, 2017	Dec, 2018	855 212.595		EIB (106), WBIF (9.595), Serbia budget (10.15), other sources (86.85)	EIB, WBIF, Serbia budget, other sources
Route 7	Pločnik	Merdare	37	Highway	Core	Feasibility Prelim	construction	2014 Feb, 2017	Dec, 2018				
Route 9a	Irig 2	Ruma 1 (motorway)	15.245	Expressway	Comprehensive	Detailed	Rehabilitation	2017	Feb-18	0.003818854	0.136	0.003818854	WB/EIB/PERS
Route 9a	Novi Sad	Ruma	112	Expressway	Comprehensive	Prelim	construction	2008		360			
Route 9a	Ruma	Šabac		Expressway	Comprehensive	Prelim	construction	2008					
Route 9a	Šabac	Loznica		Expressway	Comprehensive	Prelim	construction	2008					

Missing End date (8 sections) that is needed. Nice to have: Budget cost (state) (M€), IFI cost (M€), Funding source and Total cost (M€).

Sources in the table:

Black letters and numbers – RP

Red letters and numbers – WBIF IPF Bimonthly Report 1801-1802 and SEETO MAP 2018 Final

### 3 Road Safety Audit Plan for Projects in Activity One

Under Activity Two, the RSA Project Team has prepared a three-year plan (2018/19-2020/21) to undertake road safety audits, at various stages as per the Directive2008/96/EC and SEETO's Road Safety Audit Guidelines for the list of projects identified under Activity One. The plan includes the Audit stages that are required for each project, as well as the required Auditors inputs and indicative costs.

All roads in the plan are on the core and comprehensive network and if they become Ten-T then RSA is mandatory according to EU Directive2008/96/EC. RSA should be done on both upgrading projects and new projects.

Currently, only Republic of Srpska within BiH (and very recently also Albania) have trained and certified Road Safety Auditors within the Region. Therefore, an assumption has been made that Road Safety Audits carried out on the projects identified within Activity One will be carried out by appropriately qualified and experienced consultants.

In those projects that are IFI funded, their policies often insist on at least Design Stage Audits being carried out on those projects. Therefore, the cost of these Audits will be met by the IFIs as part of the project.

For this purpose, the following estimated costs have been provided in the table below for each stage of Audit specified in the SEETO RSA Guidelines. In addition, time estimates have been provided in person days and assuming an Audit Team of two, an Audit Team Leader (TL) and Audit Team Member (TM). These costs are based on previous Audit assignments carried out in the Region by international consultants but as more Auditors become certified within the region these costs should be revised. A cost of 600 Euros per auditor per day has been provided as an estimate.

It should be noted that some larger projects may have many design drawings for review so may take more person days and some projects have already commenced so only completion of later stages of audit are possible. This is therefore an estimate only. The costings could vary depending on scheme complexity so a typical figure has been provided as a guide.

Audit Stage	Estimated Cost (Euros)	Time Estimate (person days)
	may vary due to scheme size	may vary due to scheme size
Stage One – Prelim Design	10,200	17 (7 TL, 10 TM)
Stage Two – Detailed Design	12,000	20 (8 TL, 12 TM)
Stage Three – Pre-Opening	9,000	15 (5 TL, 10 TM)
Stage Four – Early Operation	9,000	15 (5 TL, 10 TM)

### 3.1 Albania – Plan for Road Safety Audits

Route	Section Start	Section End	Design Stage	Length (km)	START:	END:	Stage One RSA	Stage Two RSA	Stage Three RSA	Stage Four RSA	Total Cost RSA Inputs (Euros)	Total Person Days RSAs
Corridor VIII	Tirana	Vore	Detailed	16	2017	2021	Not Req	2018	2021	2021	30,000	50
Corridor VIII	Vore	Durres	Detailed	22	2017	2021	Not Req	2018	2021	2021	30,000	50
Corridor VIII	Durres	Rrogozhine		37	2017	2021	Not Req	TBC	2021	2021	18,000	30
Corridor VIII	Rrogozhine	Lushnje	Detailed	20	2017	2021	Not Req	2018	2021	2021	30,000	50
Corridor VIII	Lushnje	Fier		22	2017	2021	Not Req	TBC	2021	2021	18,000	30
Corridor VIII	Fier	Vlore	Detailed	39	2017	2021	Not Req	2018	2021	2021	30,000	50
Corridor VIII	Elbasan	Librazhd	Detailed	25	2017	2021	Not Req	2018	2021	2021	30,000	50
Corridor VIII	Librazhd	Perrenjas	Detailed	34	2017	2021	Not Req	2018	2021	2021	30,000	50
Corridor VIII	Tirana	Elbasan	Detailed	32	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 1	Shkoder	Lezhe	Detailed	42	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 1	Lezhe	Milot	Detailed	13	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 1	Mamurras	Fushe Kruje	Detailed	14	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 1	Fushe Kruje	Vore	Detailed	13	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 2b	Hani i Hotit	Shkoder		35	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 2c	Fier	Tepelene	Detailed	71	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 2c	Tepelene	Gjirokaster	Detailed	23	2017	2021	Not Req	2018*	2021	2021	18,000	50
Route 2c	Gjirokaster	Kakavija	Detailed	31	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 7	Milot	Mamurras		14	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 7	Milot	Rreshen		25.9	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 7	Rreshen	Kalimash		60.2	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 7	Kalimash	Morine		28.3	2017	2021	Not Req	2018	2021	2021	30,000	50
SH3	Perrenjas	Pogradec	Detailed	27	2017	2021	Not Req	2018	2021	2021	30,000	50
SH3	Pogradec	Korce		40	2017	2021	Not Req	2018	2021	2021	30,000	50
SH3	Korce	Kapeshtice	Detailed	32	2017	2021	Not Req	2018	2021	2021	30,000	50
SH3	Perrenjas	Qafe Thane	Detailed	13	2017	2021	Not Req	2018	2021	2021	30,000	50

### 3.2 Bosnia and Herzegovina – Plan for Road Safety Audits

Route	Name	DESIGN STAGE	Length (km)	START:	END:	Stage One RSA	Stage Two RSA	Stage Three RSA	Stage Four RSA	Total Cost RSA Inputs (Euros)	Total Person Days RSAs
Route 2a	M-16 (Klašnice 2-Šargovac)	Main design	9.453	2017		Not Req	2018	TBC	TBC	12,000	20
Route 2a	M-16 (Šargovac - Banja Luka 1)		3.911	2017		Not Req	2018	TBC	TBC	12,000	20
Route 2a	M-16 (Banja Luka 1 - Banja Luka (Čajavec))		1.056	2017		Not Req	2018	TBC	TBC	12,000	20
Route 2a	M-16 (Banja Luka (Čajavec)-Banja Luka (Rudarska))		0.956	2017		Not Req	2018	TBC	TBC	12,000	20
Route 2a	M-16 (Banja Luka (Rudarska)-Srpske Toplice)		4.318	2017		Not Req	2018	TBC	TBC	12,000	20
Route 2a	M-16 (Srpske Toplice-Karanovac)		6.692	2017		Not Req	2018	TBC	TBC	12,000	20
Route 2a	M-16 (Karanovac-Crna Rijeka)	Main design	32.786	2017/ 2018	2018	Not Req	2018	2018	2018	30,000	50
Route 2a	M-16 (Crna Rijeka-granica RS (Ugar))		6.535	2017		Not Req	2018	TBC	TBC	12,000	20
Route 2b	Brod na Drini – Hum	Main design		2016	2018	Not Req	Not Req	2018	2019	18,000	30
Route 9a	"9. Januar" Laktaši - Prnjavor	Main design	35.913	2018	2018	Not Req	2018	2018	2019	30,000	50

### 3.3 Macedonia– Plan for Road Safety Audits

Route	Name	DESIGN STAGE	Length (km)	START:	END:	Stage One RSA	Stage Two RSA	Stage Three RSA	Stage Four RSA	Total Cost RSA Inputs (Euros)	Total Person Days RSAs
Corridor VIII (Kicevo – Podmolje) and Route 8 (Podmolje – Ohrid)	Kicevo – Ohrid										
Corridor VIII	Rankovce – Kriva Palanka										
Corridor X	Demir Kapija – Smokvica	Detailed	28,2	2015	2018	Not Req	Not Req	2018	2019	18,000	30
Corridor X	Gradsko – Veles										
Corridor X	Miladinovci – Petrovec										
Corridor X	Negotino - Demir Kapija										
Corridor X	Kumanovo- Miladinovci										
Corridor X	Smokvica – Gevgelija										
Corridor Xd	Gradsko – Prilep										
Corridor Xd	Prilep – Raec		8.8								
Route 6a	Skopje - Blace	Preliminary		Apr, 2015	Mar 2018	Not Req	Not Req	2018	2018	18,000	30
Route 10	Stip – Radovis		37	2015							
Route 10	Miladinovci – Stip										

### 3.4 Kosovo – Plan for Road Safety Audits

Route	Name	DESIGN STAGE	Length (km)	START:	END:	Stage One RSA	Stage Two RSA	Stage Three RSA	Stage Four RSA	Total Cost RSA Inputs (Euros)	Total Person Days RSAs
Route 6a	Smrekonicë Mitrovivë	Preliminary/Detailed	5	2018	2020	Not Req	2018*	2020	2020	18,000	30
Route 6b	Kijevë Zahaq	Detailed	30	2018	2021	Not Req	2018	2021	2021	30,000	50
Route 6b	Pristina-Peje	Detailed	40	2015		Not Req	TBC	TBC	TBC		
Route 7	Besi Merdare/Serbia Border	Concept	26.5	Sep, 2017	Oct, 2018	Not Req	Not Req	2018	2019	18,000	30

\*Stage Two Audit completed as pilot RSA as part of this project

### 3.5 Montenegro – Plan for Road Safety Audits

Route	Name of the Project (sections)	Design Stage	Length (km)	START:	END:	Stage One RSA	Stage Two RSA	Stage Three RSA	Stage Four RSA	Total Cost RSA Inputs (Euros)	Total Person Days RSAs
Route 1	Debeli brijeg - H novi		5	2018	2018	Not Req	Not Req	2018	2019	18,000	30
Route 1	Debeli brijeg - H novi		2.4	2018	2018	Not Req	Not Req	2018	2019	18,000	30
Route 1	Petrovac - Bar		16.8	2017	2018	Not Req	Not Req	2018	2019	18,000	30
Route 2b	Šćepan polje – Plužine		25								
Route 2b	Zaborje - Jasenov polje		19	2019	2020	2019	2019	2020	2020	40,200	67
Route 2b	Jasenovo polje - Vidrovan		5.5	2018	2018	Not Req	2018	2018	2019	30,000	50
Route 2b	Danilovgrad - Podgorica		15	2017	2018	Not Req	Not Req	2018	2019	18,000	30
Route 3	Lipci - Ljuta		15	2018	2018	Not Req	Not Req	2018	2019	18,000	30
Route 4	Tivat -Budva		16	2017	2019	Not Req	Not Req	2019	2020	18,000	30
Route 4	Barski most - Dobrakovo		4.1	2017	2018	Not Req	Not Req	2018	2019	18,000	30
Route 5	Kamenovo - Petrovac		10.3	2017	2018	Not Req	Not Req	2018	2019	18,000	30
Route 5	Dobrakovo - Bijelo polje		10.3	2017	2018	Not Req	Not Req	2018	2019	18,000	30
Route 6a	Obilaznica Bijelo polje - Ribarevine		3.3	2017	2018	Not Req	2018	2018	2019	30,000	50
Route 6a	Ribarevine - Poda		14.5	2017	2018	Not Req	2018	2018	2019	30,000	50
Route 6a	Poda -Berane		12.8	2017	2018	Not Req	2018	2018	2019	30,000	50
Route 6a	Berane - Tunel Lokve		15.2	2017	2018	Not Req	2018	2018	2019	30,000	50
Route 6a	Tunel Lokve - Rožaje		14.7	2017	2018	Not Req	2018	2018	2019	30,000	50
Route 6a	Obilaznica Rožaje II Phase		5	2017	2019	Not Req	Not Req	2019	2020	18,000	30
Route 6a	Rožaje - Špiljani		20	2017	2019	Not Req	Not Req	2019	2020	18,000	30
Route 6b	Andrijevića - Berane		16	2018	2019	Not Req	2018	2019	2020	50,000	50
Route 7	Bar - Ulcinj		21.4	2018	2019	Not Req	2018	2019	2020	50,000	50
Route 7	Ribarevine - Lepenac	Detailed	14.6	2017	2018	Not Req	2018*	2018	2018	18,000	30
Route 8	Ulcinj - Krute		14.7	2017	2018	Not Req	Not Req	2018	2019	18,000	30
Route 8	Mojkovac - Kolašin	Preliminary	21.35	2018	2019	2018*	2018	2019	2019	30,000	50
Route 9a	Kolašin - Crkvine	Preliminary	8.95	2018	2019	2018*	2018	2019	2019	30,000	50
Route 10	Tuneli 7,8,9		0.67	2018	2019	Not Req	2018	2019	2020	50,000	50
Route 11	Obilaznica golubovci - Virpazar		16.5	2018	2019	Not Req	2018	2019	2020	50,000	50



Route	Name of the Project (sections)	Design Stage	Length (km)	START:	END:	Stage One RSA	Stage Two RSA	Stage Three RSA	Stage Four RSA	Total Cost RSA Inputs (Euros)	Total Person Days RSAs
Route 12	Virpazar - Paštrovačka gora		14.8	2018	2020	Not Req	2018	2020	2021	30,000	50
Route 13	Paštrovačka gora - Petrovac		7.5	2018	2020	Not Req	2018	2020	2021	30,000	50

\*Stage Two and Stage One Audits completed as pilot RSA as part of this project

### 3.6 Serbia – Plan for Road Safety Audits

Route	Name of the Project (sections)	DESIGN STAGE	Length (km)	PROJECT START:	PROJECT END:	Stage One RSA	Stage Two RSA	Stage Three RSA	Stage Four RSA	Total Cost RSA Inputs (Euros)	Total Person Days RSAs
Corridor X	Ražanj 1 Paraćin 1	Detailed	24.781	2018	Jan-19	Not Req	2018	2019	2019	30,000	50
Corridor X	Aleksinac Ražanj 1	Detailed	23.645	2018	Jan-19	Not Req	2018	2019	2019	30,000	50
Corridor X	Ruma 1 Pećinci 1	Detailed	12.99	2018	Dec-18	Not Req	2018	2018	2019	30,000	50
Corridor X	Sremska Mitrovica Ruma 1	Detailed	13.75	2018	Jan-19	Not Req	2018	2019	2019	30,000	50
Corridor X	Niš 1 (Trupale) Niš 3 (Batušinac)	Detailed	9	2018	Jan-19	Not Req	2018	2019	2019	30,000	50
Corridor X	Niš 3 (Batušinac) Niš 1 (Trupale)	Detailed	8.998	2018	Jan-19	Not Req	2018	2019	2019	30,000	50
Corridor X	Ražanj 1 Aleksinac	Detailed	23.655	2018	Jun-19	Not Req	2018	2019	2019	30,000	50
Corridor X	Brestovac 1 Doljevac 1	Detailed	6.155	2018	Apr-19	Not Req	2018	2019	2019	30,000	50
Corridor X	Border CRO/SER (Batrovci) Kuzmin	Detailed	21.805	2017	Feb-18	Not Req	2018	2018	2018	30,000	50
Route 3	Požega Kotroman	Prelim	60	2006		Not Req	TBC	TBC	TBC		
Route 4	Border of APV (Pančevo) Pančevo (Kovin)	Detailed	2.766	2017	Jul-18	Not Req	2018	2018	2019	30,000	50
Route 4	Pančevo (Kovin) Border of APV (Pančevo)	Detailed	2.754	2017	Jul-18	Not Req	2018	2018	2019	30,000	50
Route 4	Kneževići Užice 3	Detailed	15.234	2017	Jun-18	Not Req	2018	2018	2018	30,000	50
Route 4	Požega Boljare	Prelim	107	2006		Not Req	Not Req	TBC	TBC		
Route 5	Pojate Preljina	Prelim	110	2015		Not Req	Not Req	TBC	TBC		
Route 7	Merošina Prokuplje (Orljane)	Detailed	11.503	2017	Nov-18	Not Req	2018	2018	2019	30,000	50
Route 7	Beloljin Rudare	Detailed	24.171	2017	Nov-18	Not Req	2018	2018	2019	30,000	50
Route 7	Niš Pločnik	Feas	40	2014	2018	2018*	2018	TBC	TBC	12,000	20
Route 7	Pločnik Merdare	Feas	37	2014	2018	Not Req	Not Req	2018	2019	18,000	30
Route 9a	Irig 2 Ruma 1 (motorway)	Detailed	15.245	2017	Feb-18	Not Req	2018	2018	2018	30,000	50
Route 9a	Novi Sad Ruma	Prelim		2008		Not Req	Not Req	TBC	TBC		
Route 9a	Ruma Šabac	Prelim		2008		Not Req	Not Req	TBC	TBC		

Route	Name of the Project (sections)	DESIGN STAGE	Length (km)	PROJECT START:	PROJECT END:	Stage One RSA	Stage Two RSA	Stage Three RSA	Stage Four RSA	Total Cost RSA Inputs (Euros)	Total Person Days RSAs
Route 9a	Šabac Loznica	Prelim	112	2008		Not Req	Not Req	TBC	TBC		

\*Stage One Audit completed as pilot RSA as part of this project

### 3.7 Three-year plan by Corridor and Route

The following Table incorporates all information that has been received by the WB6 Regional Participants member countries or collected during investigation process presented by Corridor and Route.

Route	Section Start	Section End	Design Stage	Length (km)	START:	END:	Stage One RSA	Stage Two RSA	Stage Three RSA	Stage Four RSA	Total Cost RSA Inputs (Euros)	Total Person Days RSAs
Corridor VIII	Tirana	Vore	Detailed	16	2017	2021	Not Req	2018	2021	2021	30,000	50
Corridor VIII	Vore	Durres	Detailed	22	2017	2021	Not Req	2018	2021	2021	30,000	50
Corridor VIII	Durres	Rrogozhine		37	2017	2021	Not Req	TBC	2021	2021	18,000	30
Corridor VIII	Rrogozhine	Lushnje	Detailed	20	2017	2021	Not Req	2018	2021	2021	30,000	50
Corridor VIII	Lushnje	Fier		22	2017	2021	Not Req	Not Req	2021	2021	18,000	30
Corridor VIII	Fier	Vlore	Detailed	39	2017	2021	Not Req	2018	2021	2021	30,000	50
Corridor VIII	Elbasan	Librazhd	Detailed	25	2017	2021	Not Req	2018	2021	2021	30,000	50
Corridor VIII	Librazhd	Perrenjas	Detailed	34	2017	2021	Not Req	2018	2021	2021	30,000	50
Corridor VIII	Tirana	Elbasan	Detailed	32	2017	2021	Not Req	2018	2021	2021	30,000	50
Corridor VIII (Kicevo – Podmolje) and Route 8 (Podmolje – Ohrid)	Kicevo	Ohrid										
Corridor VIII	Rankovce	Kriva Palanka										
Corridor X	Ražanj 1	Paraćin 1	Detailed	24.781	2018	Jan-19	Not Req	2018	2019	2019	30,000	50
Corridor X	Aleksinac	Ražanj 1	Detailed	23.645	2018	Jan-19	Not Req	2018	2019	2019	30,000	50
Corridor X	Ruma 1	Pećinci 1	Detailed	12.99	2018	Dec-18	Not Req	2018	2018	2019	30,000	50
Corridor X	Sremska Mitrovica	Ruma 1	Detailed	13.75	2018	Jan-19	Not Req	2018	2019	2019	30,000	50
Corridor X	Niš 1 (Trupale)	Niš 3 (Batušinci)	Detailed	9	2018	Jan-19	Not Req	2018	2019	2019	30,000	50
Corridor X	Niš 3 (Batušinci)	Niš 1 (Trupale)	Detailed	8.998	2018	Jan-19	Not Req	2018	2019	2019	30,000	50
Corridor X	Ražanj 1	Aleksinac	Detailed	23.655	2018	Jun-19	Not Req	2018	2019	2019	30,000	50
Corridor X	Brestovac 1	Doljevac 1	Detailed	6.155	2018	Apr-19	Not Req	2018	2019	2019	30,000	50
Corridor X	Border CRO/SER (Batrovci)	Kuzmin	Detailed	21.805	2017	Feb-18	Not Req	2018	2018	2018	30,000	50
Corridor X	Demir Kapija	Smokvica	Detailed	28,2	2015	2018	Not Req	Not Req	2018	2019	18,000	30
Corridor X	Gradsko	Veles										

Route	Section Start	Section End	Design Stage	Length (km)	START:	END:	Stage One RSA	Stage Two RSA	Stage Three RSA	Stage Four RSA	Total Cost RSA Inputs (Euros)	Total Person Days RSAs
Corridor X	Miladinovci	Petrovec										
Corridor X	Negotino	Demir Kapija										
Corridor X	Kumanovo	Miladinovci										
Corridor X	Smokvica	Gevgelija										
Corridor Xd	Gradsko	Prilep										
Corridor Xd	Prilep	Raec		8.8								
Route 1	Debeli brijeg	H novi		5	2018	2018	Not Req	Not Req	2018	2019	18,000	30
Route 1	Debeli brijeg	H novi		2.4	2018	2018	Not Req	Not Req	2018	2019	18,000	30
Route 1	Petrovac	Bar		16.8	2017	2018	Not Req	Not Req	2018	2019	18,000	30
Route 1	Shkoder	Lezhe	Detailed	42	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 1	Lezhe	Milot	Detailed	13	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 1	Mamurras	Fushe Kruje	Detailed	14	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 1	Fushe Kruje	Vore	Detailed	13	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 2a	M-16 (Klašnice 2	Šargovac)	Main design	9.453	2017		Not Req	2018	TBC	TBC	12,000	20
Route 2a	M-16 (Šargovac	Banja Luka 1)		3.911	2017		Not Req	2018	TBC	TBC	12,000	20
Route 2a	M-16 (Banja Luka 1	Banja Luka (Čajavec)		1.056	2017		Not Req	2018	TBC	TBC	12,000	20
Route 2a	M-16 (Banja Luka (Čajavec)	Banja Luka (Rudarska)		0.956	2017		Not Req	2018	TBC	TBC	12,000	20
Route 2a	M-16 (Banja Luka (Rudarska)	Srpske Toplice)		4.318	2017		Not Req	2018	TBC	TBC	12,000	20
Route 2a	M-16 (Srpske Toplice	Karanovac)		6.692	2017		Not Req	2018	TBC	TBC	12,000	20
Route 2a	M-16 (Karanovac	Crna Rijeka)	Main design	32.786	2017/2018	2018	Not Req	2018	2018	2018	30,000	50
Route 2a	M-16 (Crna Rijeka	granica RS (Ugar)		6.535	2017		Not Req	2018	TBC	TBC	12,000	20
Route 2b	Brod na Drini	Hum	Main design		2016	2018	Not Req	Not Req	2018	2019	18,000	30
Route 2b	Šćepan polje	Plužine	Detailed	25								
Route 2b	Zaborje	Jasenovo polje		19	2019	2020	2019	2019	2020	2020	40,200	67
Route 2b	Jasenovo polje	Vidrovan		5.5	2018	2018	Not Req	2018	2018	2019	30,000	50
Route 2b	Danilovgrad	Podgorica		15	2017	2018	Not Req	Not Req	2018	2019	18,000	30
Route 2b	Hani i Hotit	Shkoder		35	2017	2021	Not Req	2018	2021	2021	30,000	50

Route	Section Start	Section End	Design Stage	Length (km)	START:	END:	Stage One RSA	Stage Two RSA	Stage Three RSA	Stage Four RSA	Total Cost RSA Inputs (Euros)	Total Person Days RSAs
Route 2c	Fier	Tepelene	Detailed	71	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 2c	Tepelene	Gjirokaster	Detailed	23	2017	2021	Not Req	2018	2021	2021	18,000	50
Route 2c	Gjirokaster	Kakavija	Detailed	31	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 3	Lipci	Ljuta		15	2018	2018	Not Req	Not Req	2018	2019	18,000	30
Route 3	Požega	Kotroman	Prelim	60	2006		Not Req	TBC	TBC	TBC		
Route 4	Border of APV (Pančevo)	Pančevo (Kovin)	Detailed	2.766	2017	Jul-18	Not Req	2018	2018	2019	30,000	50
Route 4	Pančevo (Kovin)	Border of APV (Pančevo)	Detailed	2.754	2017	Jul-18	Not Req	2018	2018	2019	30,000	50
Route 4	Kneževići	Užice 3	Detailed	15.234	2017	Jun-18	Not Req	2018	2018	2018	30,000	50
Route 4	Požega	Boljare	Prelim	107	2006		Not Req	Not Req	TBC	TBC		
Route 4	Tivat	Budva		16	2017	2019	Not Req	Not Req	2019	2020	18,000	30
Route 4	Barski most	Dobrakovo		4.1	2017	2018	Not Req	Not Req	2018	2019	18,000	30
Route 5	Kamenovo	Petrovac		10.3	2017	2018	TBC	TBC	TBC	TBC	TBC	TBC
Route 5	Dobrakovo	Bijelo polje		10.3	2017	2018	TBC	TBC	TBC	TBC	TBC	TBC
Route 5	Pojate	Preljina	Prelim	110	2015		Not Req	Not Req	TBC	TBC		
Route 6a	Skopje	Blace	Prelim		Apr, 2015	Mar 2018	Not Req	Not Req	2018	2018	18,000	30
Route 6a	Smrekonicë	Mitrovivë	Prelim/Detail ed	5	2018	2020	Not Req	2018	2020	2020	18,000	30
Route 6a	Obilaznica Bijelo polje	Ribarevine		3.3	2017	2018	Not Req	2018	2018	2019	30,000	50
Route 6a	Ribarevine	Poda		14.5	2017	2018	Not Req	2018	2018	2019	30,000	50
Route 6a	Poda	Berane		12.8	2017	2018	Not Req	2018	2018	2019	30,000	50
Route 6a	Berane	Tunel Lokve		15.2	2017	2018	Not Req	2018	2018	2019	30,000	50
Route 6a	Tunel Lokve	Rožaje		14.7	2017	2018	Not Req	2018	2018	2019	30,000	50
Route 6a	Obilaznica Rožaje II Phase			5	2017	2019	Not Req	Not Req	2019	2020	18,000	30
Route 6a	Rožaje	Špiljani		20	2017	2019	Not Req	Not Req	2019	2020	18,000	30
Route 6b	Kijevë	Zahaq	Detailed	30	2018	2021	Not Req	2018	2021	2021	30,000	50
Route 6b	Pristina	Peje	Detailed	40	2015		Not Req	TBC	TBC	TBC		
Route 6b	Andrijevisa	Berane		16	2018	2019	Not Req	2018	2019	2020	50,000	50
Route 7	Merošina	Prokuplje	Detailed	11.503	2017	Nov-18	Not Req	2018	2018	2019	30,000	50

Route	Section Start	Section End	Design Stage	Length (km)	START:	END:	Stage One RSA	Stage Two RSA	Stage Three RSA	Stage Four RSA	Total Cost RSA Inputs (Euros)	Total Person Days RSAs
		(Orljane)										
Route 7	Beloljin	Rudare	Detailed	24.171	2017	Nov-18	Not Req	2018	2018	2019	30,000	50
Route 7	Niš	Pločnik	Feas	40	2014	2018	2018	2018	TBC	TBC	12,000	20
Route 7	Pločnik	Merdare	Feas	37	2014	2018	Not Req	Not Req	2018	2019	18,000	30
Route 7	Bar	Ulcinj		21.4	2018	2019	Not Req	2018	2019	2020	50,000	50
Route 7	Ribarevine	Lepenac	Detailed	14.6	2017	2018	Not Req	2018	2018	2018	18,000	30
Route 7	Besi	Merdare/Serbia Border	Concept	26.5	Sep, 2017	Oct, 2018	Not Req	Not Req	2018	2019	18,000	30
Route 7	Milot	Mamurras		14	2017	2021	Not Req	2018	2021	2021	30,000	50
Route 7	Milot	Rreshen		25.9	2017	2021	Not Req	2018	2021	2021	30,000	
Route 7	Rreshen	Kalimash		21.4	2018	2019	Not Req	2018	2019	2020	50,000	50
Route 7	Kalimash	Morine		14.6	2017	2018	Not Req	2018*	2018	2018	18,000	30
Route 8	Ulcinj	Krute		14.7	2017	2018	Not Req	Not Req	2018	2019	18,000	30
Route 8	Mojkovac	Kolašin	Prelim	21.35	2018	2019	2018	2018	2019	2019	30,000	50
Route 9a	Kolašin	Crkvine	Prelim	8.95	2018	2019	2018	2018	2019	2019	30,000	50
Route 9a	Irig 2	Ruma 1 (motorway)	Detailed	15.245	2017	Feb-18	Not Req	2018	2018	2018	30,000	50
Route 9a	Novi Sad	Ruma	Prelim	112	2008		Not Req	Not Req	TBC	TBC		
Route 9a	Ruma	Šabac	Prelim		2008		Not Req	Not Req	TBC	TBC		
Route 9a	Šabac	Loznica	Prelim		2008		Not Req	Not Req	TBC	TBC		
Route 9a	Laktaši	Prnjavor	Detailed	35.913	2018	2018	Not Req	2018	2018	2019	30,000	50
Route 10	Tuneli 7,8,9			0.67	2018	2019	Not Req	2018	2019	2020	50,000	50
Route 10	Stip	Radovis		37	2015							
Route 10	Miladinovci	Stip										
Route 11	Obilaznica Golubovci	Virpazar		16.5	2018	2019	Not Req	2018	2019	2020	50,000	50
Route 12	Virpazar	Paštrovačka gora		14.8	2018	2020	Not Req	2018	2020	2021	30,000	50
Route 13	Paštrovačka gora	Petrovac		7.5	2018	2020	Not Req	2018	2020	2021	30,000	50
SH3	Perrenjas	Pogradec	Detailed	27	2017	2021	Not Req	2018	2021	2021	30,000	50
SH3	Pogradec	Korce		40	2017	2021	Not Req	2018	2021	2021	30,000	50

Route	Section Start	Section End	Design Stage	Length (km)	START:	END:	Stage One RSA	Stage Two RSA	Stage Three RSA	Stage Four RSA	Total Cost RSA Inputs (Euros)	Total Person Days RSAs
SH3	Korce	Kapeshtice	Detailed	32	2017	2021	Not Req	2018	2021	2021	30,000	50
SH3	Perrenjas	Qafe Thane	Detailed	13	2017	2021	Not Req	2018	2021	2021	30,000	50



### 3.8 Yearly allocation of resources

Based on the tables in the previous section, the following table summarises the required financial resources on a yearly basis for implementing RSAs in each Regional Participant in Euros.

	Year 1 2018	Year 2 2019	Year 3 2020	Year 4 2021	Total
<b>ALB</b>	300,000	-	-	450,000	750,000
<b>BiH</b>	144,000	18,000	-	-	162,000
<b>MKD</b>	27,000	9,000	-	-	36,000
<b>KOS</b>	33,000	9,000	18,000	18,000	78,000
<b>MNE</b>	332,400	256,200	90,000	18,000	696,600
<b>SRB</b>	291,000	180,000	-	-	471,000
<b>Total</b>	1,127,400	472,200	108,000	486,000	2,193,600

## 4 Pilot Road Safety Audits per WB6 Regional Participant

In this Activity, pilot RSAs have been carried out in each of the WB6 Regional Participants. A total of six RSAs - one in each country. These were carried out in accordance with the SEETO RSA Manual (updated 2014) and the Directive 2008/96/EC.

Requests were made in August 2017 to all RPs to identify suitable projects for the pilot road safety audits. There have been subsequent changes to the original projects with Serbia and Albania offering an alternative project design, BiH had originally proposed a project within the Republic of Srpska, however issues with certification of the team to operate in country resulted in another project in the Federation being proposed. Kosovo originally proposed a preliminary design project funded by EBRD but problems with approval have resulted in another project being put forward. The projects identified to be audited are shown in the table below.

Projects in the design stage were considered preferable as early engagement could potentially deliver the largest road safety benefits. Country missions have been completed to deliver the road safety audits and provide the opportunity for capacity building and knowledge transfer for participants. However, it is important that the audit process is completed, and designers respond to audit recommendations. There is a risk that recommendations may lead to cost increases within the project but the potential crash savings (economic benefits of saving crashes) offered in most cases far outweigh these initial construction costs. The audit team, as part of their missions, ensured all the benefits of audit were outlined and the appropriate staff in country received the latest training on the RSA process.

List of completed RSA Pilot Projects:

Participant	Proposed Project	Design Stage	RSA Mission Date	Report Submitted
Albania	SH4-O Gjirokastra By-Pass	Detailed	4-8 December 2017	16 January 2018
BiH	M5 Jajce - Donji Vakuf TBC (Federation)	Preliminary	23-25 January 2018	17 March 2018
Macedonia	A1 Lenishka – Belovodica	Detailed	9-12 October 2017	26 October 2017
Kosovo	R6a Lumadh to Smrekonicë	Preliminary	15-19 January 2018	12 February 2018
Montenegro	M-2 Kolašin Crkvine - Mojkovac	Preliminary/Detailed	12-15 February 2018	26 March 2018
Serbia	NIŠ-Pločnik	Preliminary	28-30 November 2017	21 December 2017

In preparation for the RSA Missions, the project team prepared the following guidance note to outline the roles and responsibilities, resources required for the audit mission and a proposed agenda for the visits.

The Road Safety Audit procedure is:

- ✓ A formal process – similar to quality control
- ✓ An independent process - the audit team should be independent of the project and not involved in the design (they can however be from the same organisation)
- ✓ Should be carried out by someone with appropriate road safety and design experience and training.

The parties involved in a RSA:

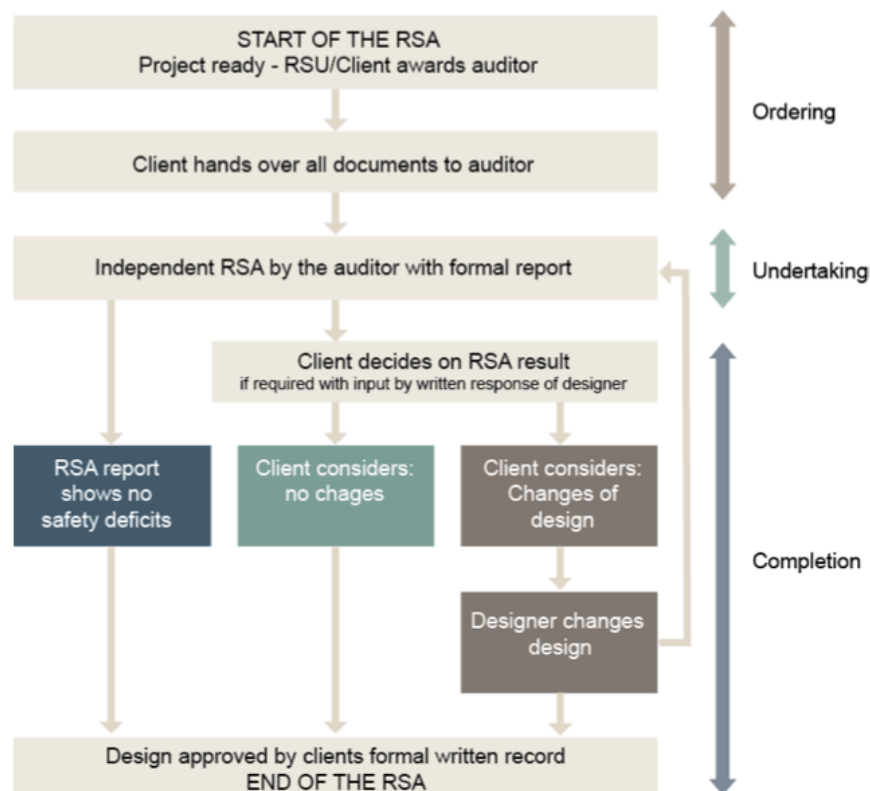


### Stakeholders in the Audit Process

Three parties are involved in the audit process:

1. The Client (usually the road authority, the Ministry relevant to Transport or private road operating company)
2. The designer (consultant or e.g. road authority)
3. The auditor.

The Client initiates the safety audits and commissions the auditor or audit team. All information and reports are distributed via the Client. Sometimes the Client may ask the designer to commission an auditor or audit team.



### The Road Safety Audit Workflow

## 4.1 Format for Missions to WB6 Regional Participants

Day and Timing	Purpose of the Meeting	Attendees
Day One AM approx. 3 Hours	<p>Introductions of all Parties.</p> <p>Audit Team Presentation on Project and Audit Process and format for rest of mission</p> <p>Design Team to introduce the Project and hand over design information to Audit Team in hard and soft copy formats</p>	<p>Audit Team</p> <p>Road Authorities</p> <p>Designer</p> <p>Any other Stakeholders</p>
Day One PM		<p>Audit Team to study submitted design information (with nominated attendees from road authority if requested) to identify points of interest for site visit on Day Two</p>
Day Two All day if required	<p>Site Visit to road project (high visibility jackets to worn by all parties)</p> <p>Audit Team to identify, discuss, clarify and any road safety problems with the design</p>	<p>Audit Team</p> <p>Road Authority</p> <p>Design Team (not essential)</p> <p>Any other interested parties</p>
Day Three PM approx. 2-3 Hours	<p>Audit Team to present findings of the Audit and discuss with all parties</p> <p>Opportunity to agree on Audit findings and recommendations and discuss practical implementation of any proposed design changes</p>	<p>Audit Team</p> <p>Road Authority</p> <p>Design Team</p> <p>Any other interested parties</p>

## 4.2 RSA Team Mission Reports

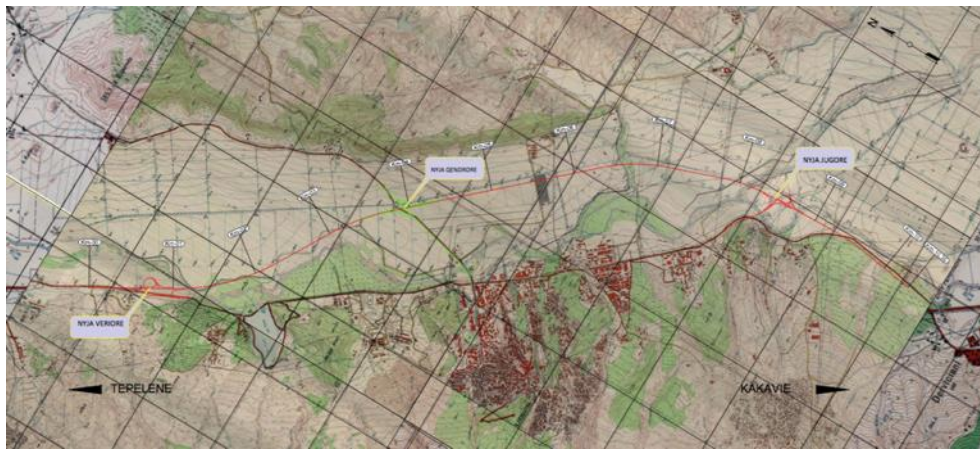
### 4.2.1 Albania

The RSA Mission to Albania took place from the 04-08 December 2017 in Tirana. The audit team consisted of:

- Matt Chamberlain – Audit Team Leader
- Darko Cvoric – Audit Team Member.

The team were also joined by Emiljano Zhuleku, the local appointed traffic engineer for Albania on the project.

The first day was spent meeting Mr Nikolin Berxhiku, representatives from ARA and the design team. The Audit Team explained the process and the format for the rest of the mission and what the aims and objectives of the mission were. The designer presented the project for the RSA the E853 Gjirokaster By-Pass and hard and soft copies of the design drawings were supplied to the Audit Team.



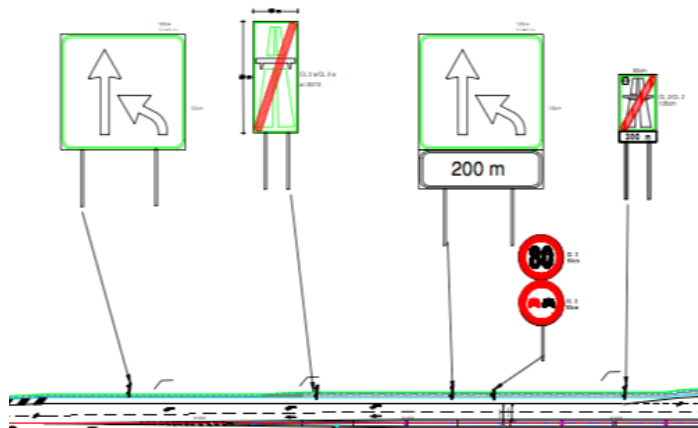
Proposed Alignment of Gjirokaster By-Pass.

Due to extensive flooding in the area the Audit Team were not able to visit the site, so a desktop study of the drawings was undertaken on the 5/6<sup>th</sup> December 2017.

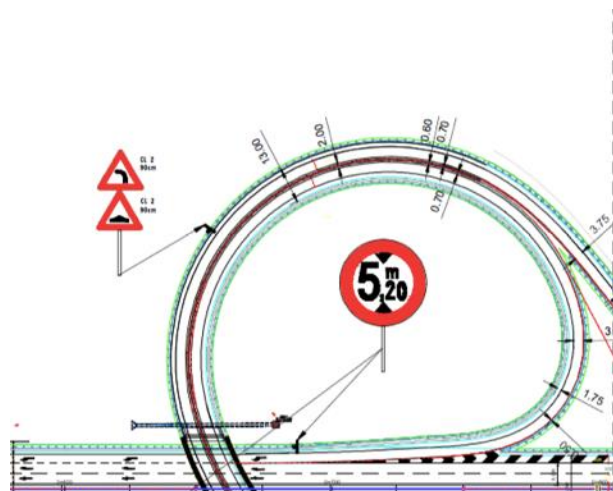
The main issues resulting from the desktop Audit concerned:

- Signing design and location
- Crash barrier design.

#### 4.2.1.1 Signing Design and Location



Example from western end of scheme, sign spacing too small and merge signs potentially masked by larger signs.

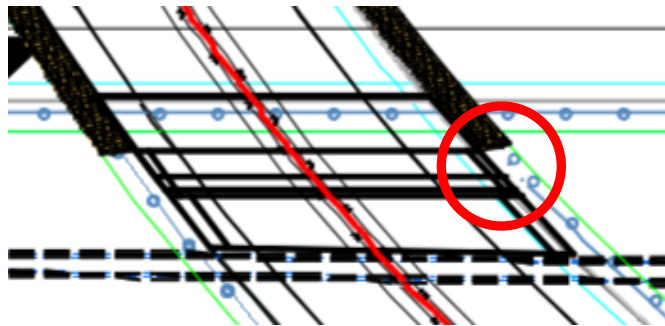


Example from Nyja Veriore Interchange – no chevron signing provided on compound radius.

#### 4.2.1.2 Crash Barrier Design



Example from Nyja Veriore interchange, hazardous potential gap in crash barrier at diverge point could be hazardous to an errant vehicle.



Example from Nyja Veriore interchange, no detail of connection between barrier types, the steel crash barrier is not connected to the bridge parapet. If steel barrier is struck by an errant vehicle, they will impact end of bridge parapet.



Example of a safe connection between different barrier types from the United Kingdom.

The audit team presented their findings to Ariana Hasani from ARA, Mr Nikolin Berxhiku from MoT and other representatives from ARA and the design team.

The completed Audit Report was delivered to ARA and the MoT on the 16<sup>th</sup> January 2018 and at the time of writing, the audit team are awaiting the designer's response.

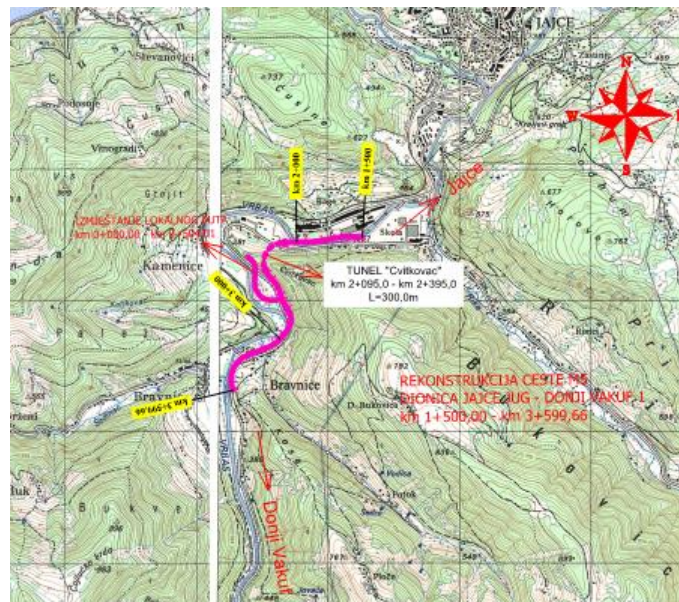


## 4.2.2 Bosnia and Herzegovina

The RSA Mission to BiH took place from the 23-25 January 2018 in Sarajevo. The audit team consisted of:

- Matt Chamberlain – Audit Team Leader
- Lárus Ágústsson – Audit Team Member
- Darko Cvoric – Audit Team Member.

The first day was spent meeting representatives from PC Roads of FBiH (JP Ceste FBiH) and representatives from the MoT. The Audit Team explained the process and the format for the rest of the mission and what the aims and objectives of the mission were. The design was presented for the RSA which is the section of the M5 Jajce - Donji Vakuf and hard and soft copies of the design drawings were supplied to the Audit Team.



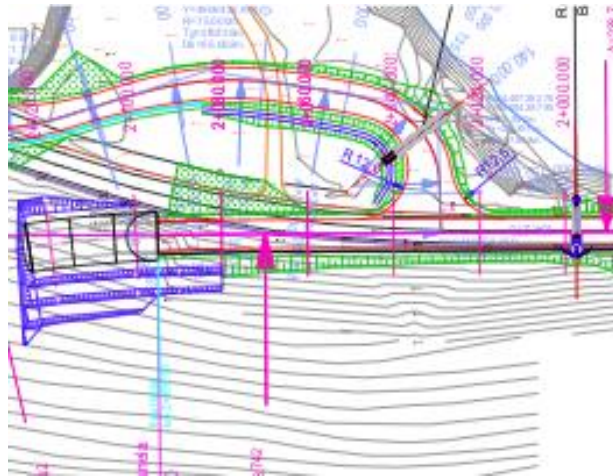
Proposed section of M5

The audit team, accompanied by representatives from PC Roads of FBiH (JP Ceste FBiH) and visited the site on the 24<sup>th</sup> January and identified any road safety problems.

The main issues resulting from the desktop Audit concerned:

- Junction Design
- Crash Barrier Design
- Tunnel Design.

#### 4.2.2.1 Junction Design



**Example from planned project – junction has no sheltered left turning lane, poor potential to and from the junction and tight radii unsuitable for large vehicles who will be required to use the proposed junction.**

#### 4.2.2.2 Crash Barrier Design



**Example of existing crash barrier – unsafe terminal end and also too short and does not fully protect the hazard. The design should incorporate energy absorbent terminals.**



**An example of an energy absorbent end terminal from the United Kingdom.**

#### 4.2.2.3 Tunnel Design



**Existing tunnel just north of project section – tunnel portal forms a roadside hazard and lane widths very tight for two large vehicles to safely pass. New design should ensure adequate clearance for two large vehicles to pass.**



**Example from another new road project in BiH – crash cushion fitted on tunnel headwall.**

The audit team presented to representatives from PC Roads of FBiH (JP Ceste FBiH). All recommendations from the audit were verbally agreed.

The completed Audit Report was delivered to PC Roads of FBiH (JP Ceste FBiH) on the 17<sup>th</sup> March 2018 and at the time of writing, the audit team are awaiting the designer's response.



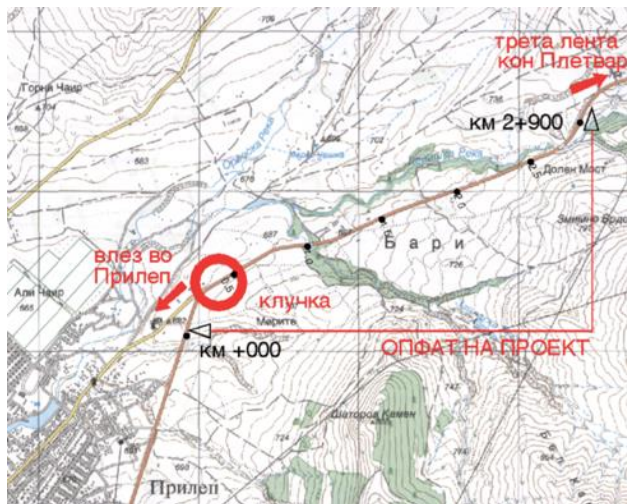
### 4.2.3 Macedonia

The RSA Mission to Macedonia took place from the 9<sup>th</sup> to 12<sup>th</sup> October 2017 in Skopje. The audit team consisted of:

- Matt Chamberlain – Audit Team Leader
- Larus Agustsson – Audit Team Member.

The team were also joined by Jani Hristoski, the local appointed traffic engineer for Macedonia on the project.

The first day was spent meeting Darko Miceski and Darko Spiroski from the Ministry of Transport (MoT), Kiril Karkalesev from PESR and the Riste Ristov from the Designers, Prostor DOO Kumanovo. The Audit Team explained the process and the format for the rest of the mission and what the aims and objectives of the mission were. The designer introduced the project for RSA, A1 Lenishka – Belovodica and hard and soft copies of the design drawings were supplied to the Audit Team.



The Project consists of two parts:

Section One Leniska



## Section Two Belovdica

The main issues resulting from the Audit concerned:

- Crash barrier design
- Junction layouts
- Gore lengths and entry and exit radii on grade separated junctions
- Bridge parapet design and interface with crash barrier.

### 4.2.3.1 Crash Barrier Design

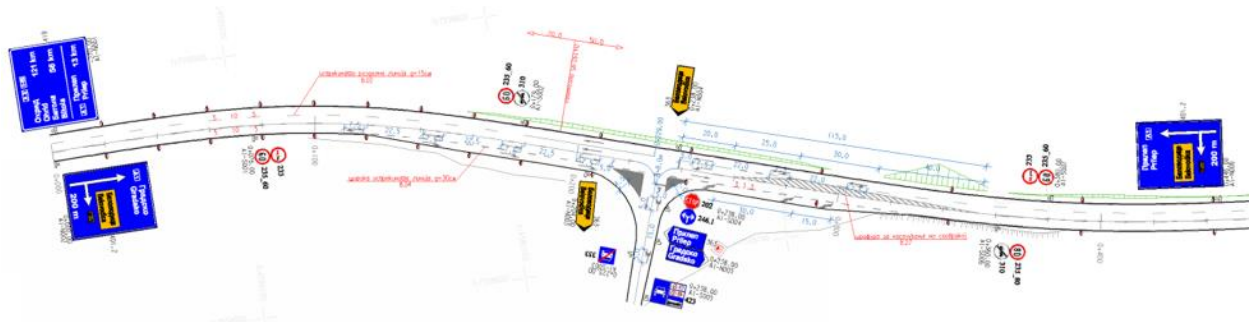


**Examples of existing ramped and unsafe crash barrier terminals from the site visit. The barrier could be hazardous to errant vehicles and in many cases is too short and does not adequately protect the hazard.**



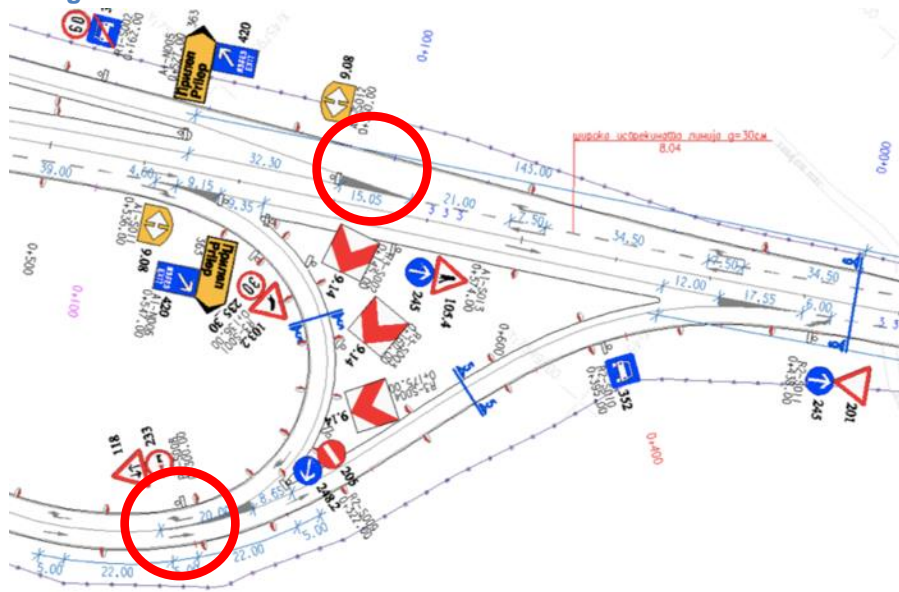
An example of an energy absorbent end terminal from the United Kingdom

#### 4.2.3.2 Junction Layouts



An example junction from the Audit within Section One. Two lanes continued through the junction with poor merge arrangement and no protection for left turning vehicles

#### 4.2.3.3 Gore Lengths and Radii



An extract from the proposed junction at Prilep. Potential conflict point between opposing lanes with no separation. Extra wide exit lane encouraging two vehicles to exit or late exit manoeuvres

#### 4.2.3.4 Bridge Parapet Design



Existing Bridge in Section Two – poor design and condition of existing bridge parapet and no connection between barrier types, the steel crash barrier is not connected to the bridge parapet. If steel barrier is struck by an errant vehicle they will impact end of bridge parapet or potentially enter the river





### **Example of a safe connection between different barrier types from the United Kingdom**

The audit team presented their findings to the MoT, PESR and the designers on the 12<sup>th</sup> October and all recommendations were verbally accepted.

The completed Audit Report was delivered to the MoT on the 26th October 2017 and at the time of writing, the audit team are awaiting the designer's response.



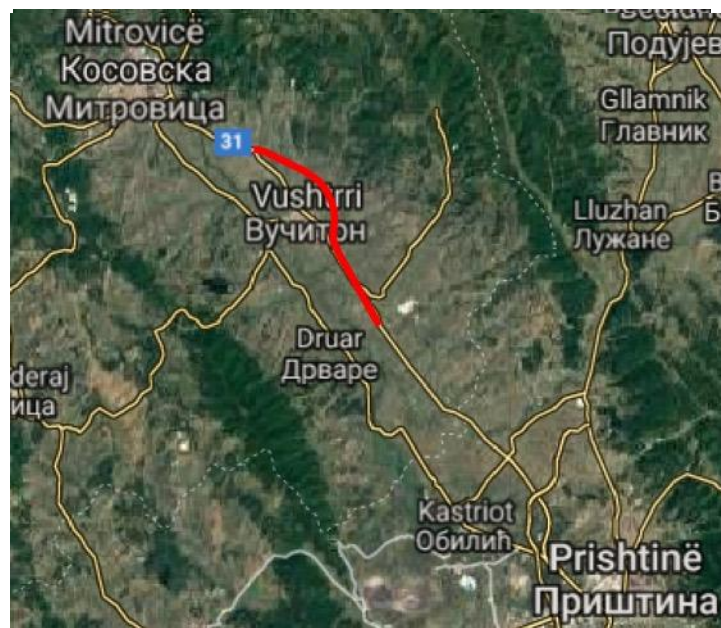
## 4.2.4 Kosovo

The RSA Mission to Kosovo took place from the 15-19 January 2018 in Pristina. The audit team consisted of:

- Matt Chamberlain – Audit Team Leader
- Lárus Ágústsson – Audit Team Member
- Darko Cvoric – Audit Team Member.

The team were also joined by Emiljano Zhuleku, the local appointed traffic engineer for Kosovo on the project.

The first day was spent meeting Emir Morina, Gjynejt Mustafa and other representatives from the Infrastructure Directorate. The Audit Team explained the process and the format for the rest of the mission and what the aims and objectives of the mission were. The design was presented for the RSA which is the section of the R6a Lumadh to Smrekonicë and hard and soft copies of the design drawings were supplied to the Audit Team.



Proposed section of R6a

The audit team, accompanied by representatives from the Infrastructure Directorate and Kosovo Police, visited the site on the 17<sup>th</sup> January and identified any road safety problems.

The main issues resulting from the Audit concerned:

- Crash barrier design
- Junction Design
- Accesses
- Roundabout Design.

#### 4.2.4.1 Crash Barrier Design



**Example from existing road in a settlement with frequent gaps in the crash barrier and hazardous end terminals. Crash barrier should not be used in urban areas and this should be avoided in the new design.**

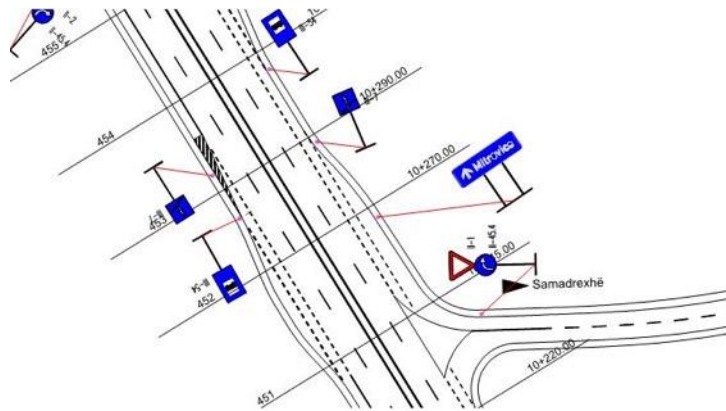


**Example from existing road – bridge parapet and barrier not connected. The new design should have a secure connection between barrier types.**



**Example of a safe connection between different barrier types from the United Kingdom.**

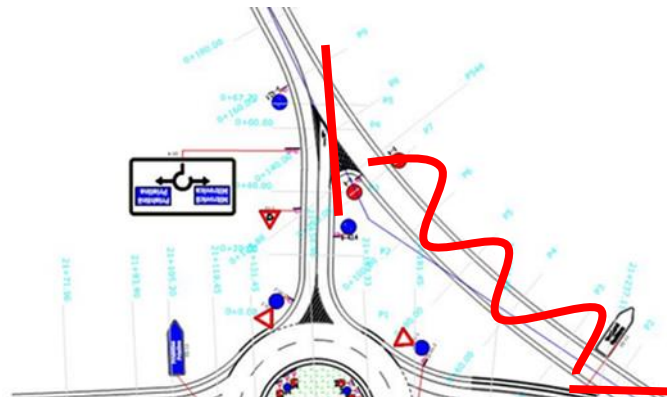
#### 4.2.4.2 Junction Design



Example of planned junction from the project – very short acceleration and deceleration lanes.

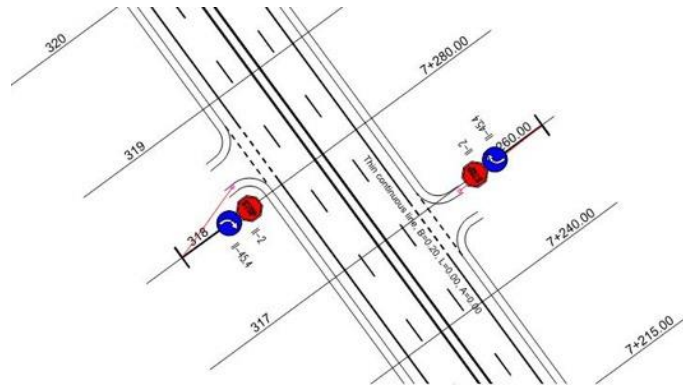


Example of planned junction from the project – no opportunity for vehicles to turn left from the south or right from the north – an at grade roundabout would be more appropriate.



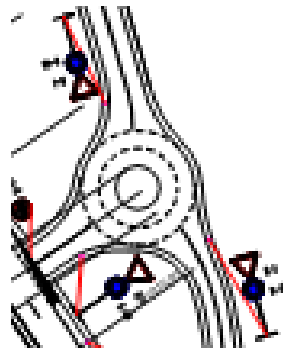
Example of planned junction from the project – Y-type interchanges are unsafe and should be avoided in the new design. The short section to by-pass roundabout should be removed and all vehicles will use the roundabout.

#### 4.2.4.3 Accesses

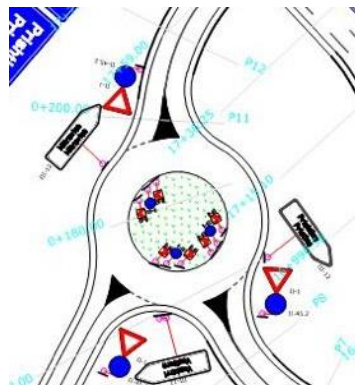


**Example of from project – many accesses directly onto the highway with risk of slowing vehicles and vehicles trying to access onto the mainline. The cross section should be adjusted with extra wide shoulder to act as sheltered lane for drivers entering/exiting accesses. Where many accesses exist, the speed limit should be reduced.**

#### 4.2.4.4 Roundabout Design



**Example roundabout from project – single lane roundabout entries do not require two circulating lanes. This can lead to side swipe crashes. The deflection north to south is also very poor and no deflection splitter islands provided or signing.**



**Another example roundabout from project – good roundabout design with good deflection, single circulatory lane, splitter islands and correct signing.**

The audit team presented their findings to Mr Emir Morina, Mr Gjynejt Mustafa and other representatives from the Infrastructure Directorate. All recommendations from the audit were verbally agreed.

The completed Audit Report was delivered to the Infrastructure Directorate on the 12<sup>th</sup> February 2018 and at the time of writing, the audit team are awaiting the designer's response.



## 4.2.5 Montenegro

The RSA Mission to Montenegro took place from the 12-15 February 2018 in Podgorica. The audit team consisted of:

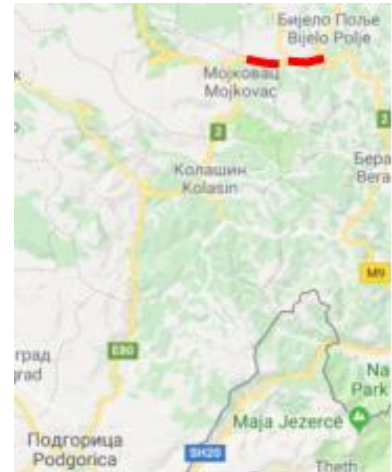
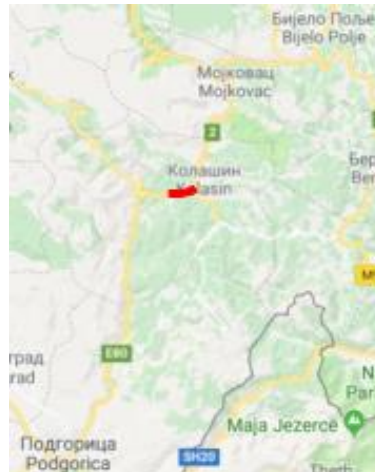
- Lárus Ágústsson – Audit Team Member
- Darko Cvoric – Audit Team Member.

The team were also joined by Dusan Savkovic, the local appointed traffic engineer for Montenegro on the project.

The first day was spent meeting representatives from MoT and the Design Team. The Audit Team explained the process and the format for the rest of the mission and what the aims and objectives of the mission were. The designs were presented for three sections of the of the M-2 Kolašin Crkvine - Mojkovac and hard and soft copies of the design drawings were supplied to the Audit Team.

The three sections audited were:

- Section One - Crkvine to Kolasin – carried out as a Stage One RSA
- Section Two - Kolasin to Mojkovac – carried out as a Stage One RSA
- Section Three - Lepenac – Ribarevine – carried out as a Stage Two RSA.



Plan of Section One

Plan of Section Two

The audit team, accompanied by representatives from MoT and Designers visited the site on the 13<sup>th</sup> February and identified any road safety problems.

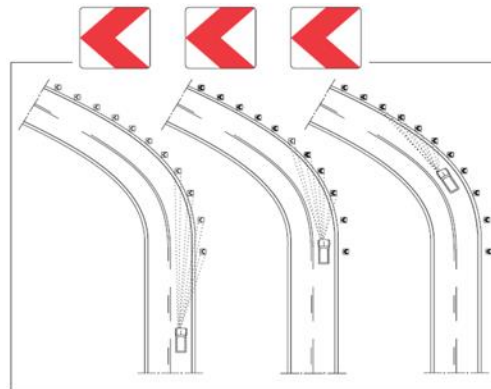
The main issues resulting from the Audits concerned:

- Road Alignment
- Crash Barrier Design
- Junction Design.

#### 4.2.5.1 Road Alignment



**Example from Section Two of planned project – existing bends are poorly signed at proposed to raise speed limit to 60kph on the sections. Chevron signs are poorly located and not conspicuous.**



**Example of good design for chevron signs and good conspicuous signs with colour contrast.**

#### 4.2.5.2 Crash Barrier Design



**Example from Section Two – existing crash barrier is too short and with an unsafe terminal end.**



**Example from Section One – gap in crash barrier between steel barrier and bridge parapet.**



**Existing underpass in Section Two – underpass headwall forms a roadside hazard and unsafe barrier terminal is also unsafe.**



**An example of an energy absorbent end terminal from the United Kingdom.**





**Example from another new road project in the Region – crash cushion fitted on tunnel headwall.**

#### 4.2.5.3 Junction Design



**Example from Section Three – very relaxed junction radii encourage high entry and exit speeds.**

The audit team presented the findings from all three sections to representatives from MoT and the Design Team. All recommendations from the audit were verbally agreed.

The completed Audit Report was delivered to MoT on the 26<sup>th</sup> March 2018 and at the time of writing, the audit team are awaiting the designer's response.

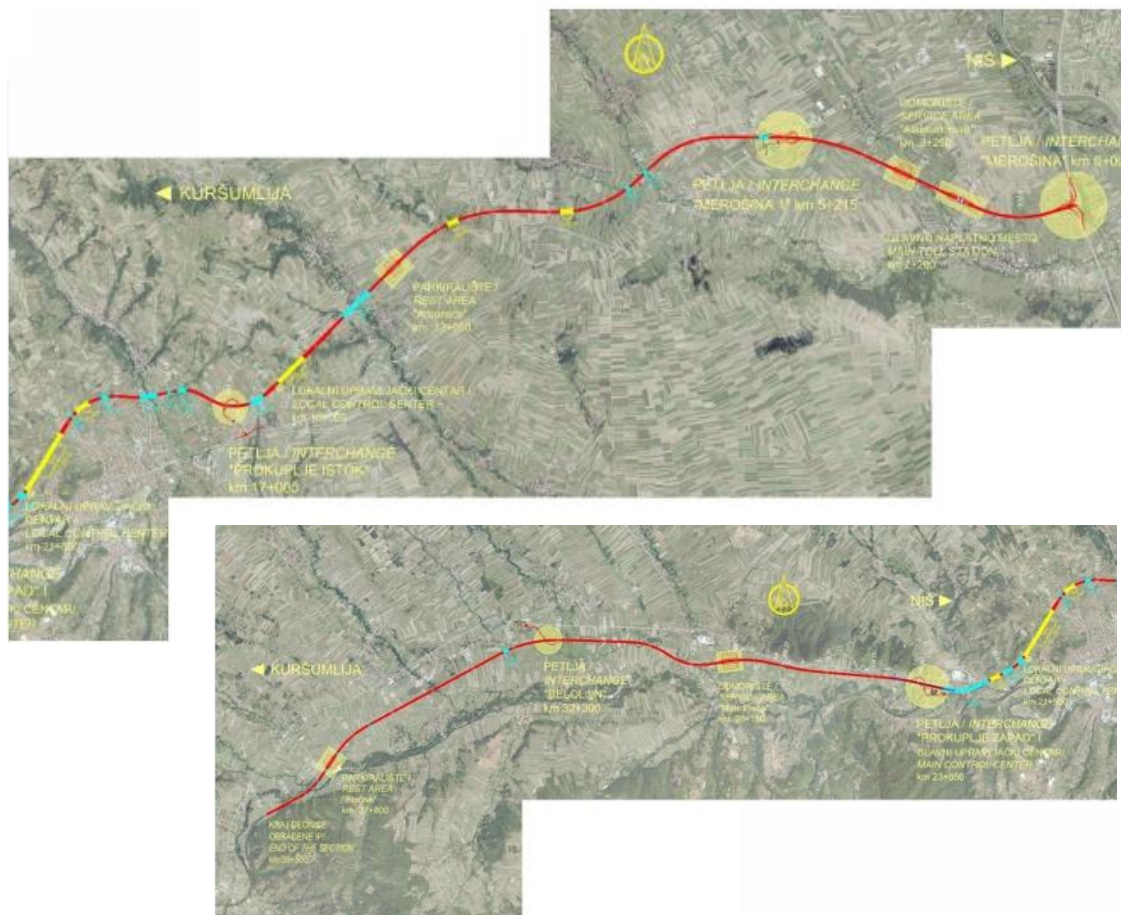
## 4.2.6 Serbia

The RSA Mission to Serbia took place from the 28-30 November 2017 in Belgrade. The audit team consisted of:

- Matt Chamberlain – Audit Team Leader
- Larus Agustsson – Audit Team Member
- Darko Cvoric – Audit Team Member.

The team were also joined by Dusan Savkovic, the local appointed traffic engineer for Serbia on the project.

The first day was spent meeting representatives from the Ministry of Construction, Transport and Infrastructure, Public Roads Serbia and CeS.TRA, the designers on the project. The Audit Team explained the process and the format for the rest of the mission and what the aims and objectives of the mission were. The designer presented the project for the RSA, E80 section Niš-Pločnik and hard and soft copies of the design drawings were supplied to the Audit Team.



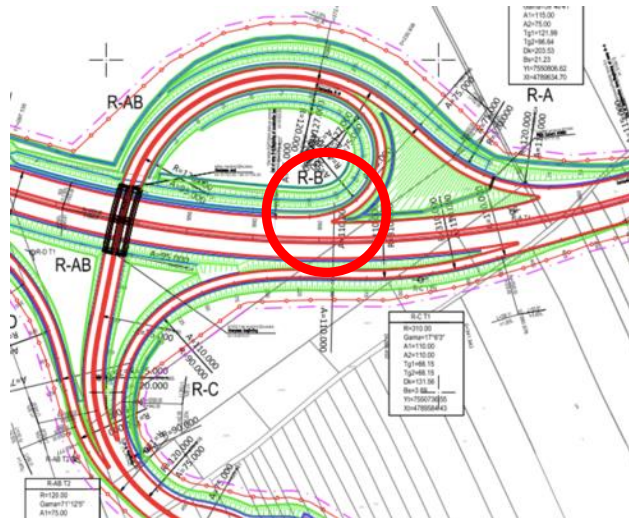
Proposed Alignment of E80 Niš-Pločnik

The audit team, accompanied by representatives from Public Roads Serbia and CeS.TRA visited the site on the 29<sup>th</sup> November and identified any road safety problems.

The main issues resulting from the Audit concerned:

- Interchange Geometry
- Roundabout Location.

#### 4.2.6.1 Interchange Geometry





**View looking west – new roundabout will be located just over crest.**

The audit team presented their findings to Ministry of Construction, Transport and Infrastructure, Public Roads Serbia and CeS.TRA on the 30<sup>th</sup> November and all recommendations were verbally accepted.

The completed Audit Report was delivered to Public Roads Serbia on the 21st December 2017 and at the time of writing, the audit team are awaiting the designer's response.

## 5 Summary and Conclusions

Many roads are upgraded and constructed on the core and comprehensive network and to help ensure improved road safety it is important to include road safety audits in the design and construction process. In addition, all roads in the plan are on the core and comprehensive network and if they become Ten-T then RSA is mandatory according to EU Directive 2008/96/EC. RSA should be done on both upgrading projects and new projects.

Following the completion of the missions to undertake pilot RSAs in each of the regional participants, the opinion from each participant is that the missions were very valuable in raising awareness of the audit process and its benefits. In several RPs, there was an opinion that audits result in large increases in project costs. Through the pilots, the audit team successfully demonstrated that this is not the case and very often, recommendations from audits may involve cost savings in design and construction.

Although at the time of writing no designers responses have been received from the submitted audit reports, verbal feedback from all participants was that every effort would be made to incorporate the recommendations from the audit reports into the designs.

The audits carried out at preliminary design phase also demonstrated that potentially unsafe design options can be modified at an early stage and will deliver the largest potential safety benefits. Therefore, the audit team were able to show participants that early engagement of auditors in the design process is the most effective.

The missions also identified that there is real enthusiasm to try and develop internal audit capabilities within the region. Serbia and Kosovo were particularly interested in how they might best manage the audit process in the future and how they might select, train and certify auditors in the future.

The audit plans produced as part of this assignment will also will be a useful tool for participants to give some guidance on timing and appropriate costs for the different stages.

In the six audits carried out, there were some common issues shared within all RPs. This has highlighted that certain areas of design require urgent review. Crash barrier design is one area where all participants agreed new standards and guidance for designers was urgently needed. Consistent use of unsafe barrier terminals, short barrier lengths, gaps in barrier and outdated bridge parapet design were common problems in all audits. Junction and interchange design was also a common issue and is outdated and not in line with international best practice.